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Bibliometric Analysis of Articles Published in Acta Orthopaedica et Traumatologica Turcica Between 2013 and 2023

2013-2023 Yılları Arasında Acta Orthopaedica et Traumatologica Turcica'da Yayımlanan Makalelerin Bibliyometrik Analizi

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ABSTRACT

Aim: This study aims to perform a bibliometric analysis of articles published in Acta Orthopaedica et Traumatologica Turcica (AOTT) from 2013 to 2023.
Methods: Articles published in AOTT from January 2013 to December 2023 were analyzed using bibliometric methods. The analysis included article type, number of authors, number of institutions authors worked for, country of the first author, international collaboration for Turkish authors, citation counts, and numbers of reads and downloads.
Results: 1035 articles were reviewed, with a significant portion being retrospective studies (44.4%). Basic science studies constituted 16.5% of the total, closely followed by case reports (15.7%). The structure of the institution where the first author worked was a university hospital, in 603 articles (58.26%). In 932 articles (90.05%), the gender of the first author was male, and in 103 articles (9.95%), the gender of the first author was female. The total number of authors ranged from 1 to 15 (average: 4.75±1.53, median: 5), and the number of institutions authors worked for averaged 2.24±1.32 (range: 1-14, median: 2). Citation numbers ranged from 1 to 186 (average: 12.78±15.68, median: 8). The total number of citations to all articles was 15127.
Conclusion: This study reveals the status and trends of articles published in AOTT over 11 years.

Key Words: Orthopedics, citation count, bibliometric analysis, article

ÖZ

Amaç: Bu çalışma, 2013-2023 yılları arasında Acta Orthopaedica et Traumatologica Turcica'da (AOTT) yayımlanan makalelerin bibliyometrik analizini gerçekleştirmeyi amaçlamaktadır.
Yöntem: 2013 Ocak ile 2023 Aralık arasında AOTT'da yayımlanan makaleler bibliyometrik yöntemler kullanılarak analiz edilmiştir. Analiz; makalelerin türü, yazar sayısı, yazarların çalıştığı kurum sayısı, ilk yazarın ülkesi, Türk yazarlar için uluslararası iş birliği, atıf sayıları, okunma ve indirilme sayılarını kapsamıştır.
Bulgular: Toplam 1035 makale gözden geçirildi, çalışmaların önemli bir kısmı retrospektif çalışma (%44.4) idi. Temel bilim çalışmaları yayımlanan makalelerin %16,5'ini, vaka raporları ise %15,7'sini oluşturdu. Birinci yazarın çalıştığı kurumun yapısı 603 (%58.26) makalede üniversite hastanesiydi. Toplam 932 makalede (90.05%) ilk yazarının cinsiyeti erkek, 103 makalede (9.95%) ise kadın idi. Toplam yazar sayısı 1 ile 15 (ortalama: 4.75±1.53, medyan: 5) arasında değişirken, yazarların çalıştıkları kurum sayısı ise ortalama 2.24±1.32 (dağılım: 1-14, medyan: 2) olarak bulundu. Atıf sayısının 1 ile 186 (ortalama:12.78±15.68, medyan:8) arasında değiştiği saptandı. Tüm makalelere yapılan toplam atıf sayısı 15127 idi.
Sonuç: Bu çalışma AOTT'de 11 yıllık süre içinde yayımlanmış makalelerin durumunu ve eğilimlerini ortaya koymuştur.

Anahtar Sözcükler: Ortopedi, atıf sayısı, bibliyometrik analiz, makale

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Introduction

In recent years, as the number and diversity of scientific studies have increased, the bibliometric analysis of articles published in journals has become an important research area for researchers and academics. Bibliometrics analyzes the numerical data of scientific publications to assess their dissemination trends, impact levels, and citations. These analyses provide valuable information for identifying trends in scientific research, guiding publication strategies, and understanding the development of research fields [1-2].

The 21st century has seen rapid scientific development in medicine, some of which have occurred in specific areas such as orthopedics and traumatology. During this time, respected journals like Acta Orthopaedica et Traumatologica Turcica (AOTT) have been essential platforms for publishing research in these fields. The articles published in this journal reflect scientific advancements ranging from clinical practices to laboratory research. AOTT is the official publication of the Turkish Society of Orthopaedics and Traumatology (TOTDER) and the Union of Turkish Societies of Orthopaedics and Traumatology (TOTBID). This journal is independent, impartial, and publishes bimonthly in English as a scientific, open-access journal adhering to double-blind peer review principles. It is published every two months, in January, March, May, July, September, and November. The journal's Impact Factor was 0.226 in 2008, 0.614 in 2014, 1.0 in 2024, and the 5-year Impact Factor is 1.6 [3-4].

This study, conducted with the utmost thoroughness, aims to co-examine the articles published in AOTT between 2013 and 2023 using bibliometric methods, determining their publication trends and structural features. The particular value of this study stems from the fact that AOTT has been a leading catalyst for orthopedic and traumatology research in Turkey. During this period, the articles published in the journal have reached a wide readership, both nationally and internationally. The results of this study will contribute to the review process of AOTT's publication strategies and will guide future research. Additionally, it will be an essential resource for researchers in orthopedics and traumatology and will serve as a guide for future research in this area.

Material and Methods

The articles published between January 2013 and December 2023 in the archive section of the AOTT website (https://www.aott.org.tr) were evaluated. The evaluation criteria previously used by Yalçınkaya et al. for the bibliometric analysis of articles published between January 2003 and December 2012 were employed [5]. In addition to these criteria, the gender of the first author, the presence of international collaboration (for Turkish authors), citation counts, reading counts, and download numbers of the published articles were also assessed. Editorials, letters to the editor, and conference proceedings were excluded from the evaluation. Additionally, two articles published twice in May and September 2016 were excluded from the study.

The published articles were classified as retrospective observational studies, prospective observational studies, reviews, basic science studies, surveys, technical notes, and case presentations. Their subtypes divided observational studies into surgical, conservative, laboratory, radiological, and epidemiological studies. Basic science studies were further categorized into animal experiments, human cadaver studies, biomechanical studies, and laboratory studies. Case presentations were also divided into surgical and conservative treatments [5].

Orthopedic sub-disciplines subdivided the published articles into general orthopedics, pediatric orthopedics, orthopedic trauma, foot and ankle, shoulder and elbow, sports injuries/ arthroscopy, adult reconstruction/arthroplasty, spine, hand and microsurgery, external fixation, and orthopedic oncology. Spine fractures and pediatric spine pathologies were evaluated under the spine category. Isolated traumas of the hand and wrist were assessed under the orthopedic trauma category [5].

Each article was evaluated individually, assessing the gender of the first author, number of authors, number of institutions the authors worked for, the structure of the institution where the first author worked, the first author's country, the first author's

specialty, presence of international collaboration, time between submission and acceptance (in months), sample size, outcome of the study (positive/neutral/negative), presence of statistical methods, and whether financial support was received. The study's outcome was considered positive if it showed a favorable result, negative if it showed an undesirable or harmful outcome, and neutral if no significant difference was found [5].

All published articles were searched in the Google Scholar database to record the total number of citations. The number of reads and downloads for each article on the AOTT website was also recorded.

Statistical analysis

Data were analyzed using a Python software package. $p<0.05$ and correlation coefficient $r>+/-0.3$ were considered statistically significant. ANOVA test was used to evaluate the differences between the number of authors and the institutions they worked in-between years. The chi-square test was used to analyze the distribution of articles according to years. In addition, t-test and correlation analysis were used to examine the relationships between the number of citations and article types.

Results

Between 2013 and 2023, a total of 1035 articles were evaluated. It was observed that 460 articles (44.4%) were retrospective, 171 articles (16.5%) were basic science studies, 163 articles (15.7%) were case presentations, 128 articles (12.3%) were prospective, 51 articles (4.9%) were reviews, 42 articles (4%) were survey studies, and 20 articles (1.9%) were technical notes. The detailed analysis of article types by year is shown in Table 1.

The distribution of published articles by subspecialties of orthopedics by year is summarized in Table 2 and Graph 1. According to the chi-squared test results, statistically significant differences were found in the number of articles across orthopedic subspecialties over the years ($p<0.05$, $p=0.000687$). When the expected and observed frequencies of articles by orthopedic subspecialties were compared statistically (post-hoc analysis), it was found that in 2016, the number of articles in pediatric orthopedics was below expectations, while in 2022, it was above expectations (standardized residual value: -2.08 to 2.38). In 2023, the number of articles in orthopedic oncology was below expectations; in 2019, it exceeded expectations (standardized residual value: -2.17 to 2.84). Similarly, in 2018, the number of articles on spine, shoulder, and elbow was above expectations, while in general orthopedics, it was below expectations (standardized residual value: 2.94 and 3.1 to -2.45).

The total number of authors in the published articles ranged from 1 to 15 (average: 4.75±1.53, median: 5). According to the results, no statistically significant difference was found in the number of authors over the years ($p>0.05$, $p=0.661$). The number of institutions the authors were affiliated with averaged 2.24±1.32 (range: 1-14, median: 2).

When the published articles were examined based on the gender of the first author, it was found that in 932 articles (90.05%), the first author was male, and in 103 articles (9.95%), the first author was female. Statistical analysis over the years showed that the number of male first authors was significantly higher than that of female first authors ($p<0.05$, $p=5.15\times10^{-9}$).

The affiliation of the first author was identified as university hospital in 603 articles (58.26%), training and research hospital in 194 articles (18.74%), state hospital in 124 articles (11.98%), private hospital in 99 articles (9.57%), military hospital in 10 articles (0.97%), and other institutions in 5 articles (0.48%). According to the results, statistically significant differences were found in the affiliation structure of the first authors over the years ($p<0.05$, $p=0.0071$). In 2018 and 2021, the number of first authors working in military hospitals was higher than expected (standardized residuals: 2.28 and 2.24). In 2017, the number of first authors working in private hospitals was lower than expected, and in 2019, it was the opposite, higher than anticipated (standardized residuals: -2.1 to 2.63). Additionally, in 2022, the number of first authors working in state hospitals was higher than expected (standardized residuals: 2.11).

The country of the first author is Turkey in 712 (68.79%) articles, China in 94 (9.08%) articles,

Table 1: Number of article types by year

Year	Retrospective Basic	Science Study	Case Report	Prospective Review	Review	Survey	Technical Not	Total
2013	30	21	18	7	-	-	1	77
2014	59	21	24	10	4	1	3	122
2015	53	19	22	13	4	3	1	115
2016	56	20	19	11	2	9	2	119
2017	48	14	19	8	3	4	3	99
2018	28	12	15	23	6	5	1	90
2019	39	9	13	21	9	4	-	95
2020	47	15	12	10	5	6	2	97
2021	45	11	8	11	9	4	4	92
2022	37	11	9	5	5	5	1	73
2023	18	18	4	9	4	1	2	56
Total	460	171	163	128	51	42	20	1035

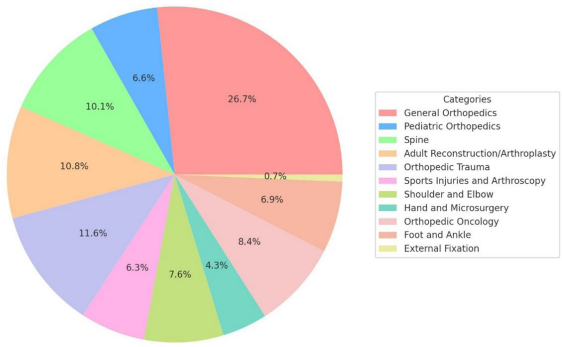
Table 2: Distribution of prospective/retrospective articles by subtypes according to years

Year	Article Type	Surgical Treatment	Conservative Treatment	Laboratory Study	Radiological Study	Epidemiological Study
2013	Prospective	4	1	-	-	2
	Retrospective	21	2	-	2	5
2014	Prospective	1	6	1	1	1
	Retrospective	39	9	2	5	4
2015	Prospective	6	4	2	1	-
	Retrospective	36	4	2	7	4
2016	Prospective	4	4	2	1	-
	Retrospective	38	4	6	4	4
2017	Prospective	3	5	-	-	-
	Retrospective	35	3	2	6	2
2018	Prospective	17	5	-	1	-
	Retrospective	17	6	-	2	3
2019	Prospective	13	3	-	4	1
	Retrospective	26	5	-	6	2
2020	Prospective	3	5	1	1	-
	Retrospective	29	4	2	8	4
2021	Prospective	7	1	2	-	1
	Retrospective	25	2	1	5	12
2022	Prospective	3	-	1	-	1
	Retrospective	26	1	-	4	6
2023	Prospective	4	1	2	-	2
	Retrospective	8	3	-	2	5

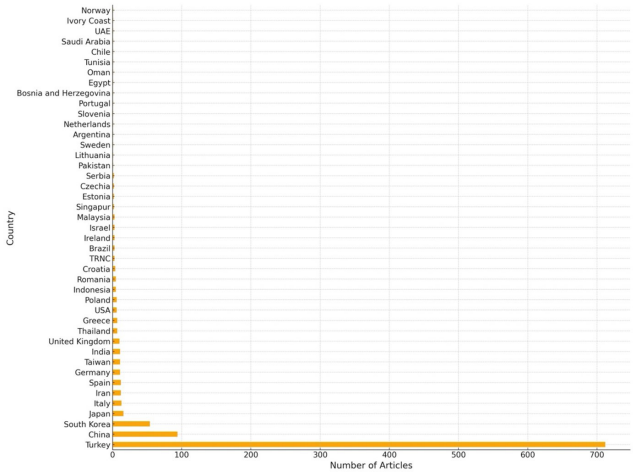
South Korea in 54 (5.22%) articles, Japan in 16 (1.55%) articles, Italy in 13 (1.26%) articles, India, Taiwan and Germany in 12 (1.06%) articles, United Kingdom in 10 (0.96%) articles, Greece and Thailand in 7 (0.68%) articles, India, Taiwan, and Germany in 11 (1.06%) articles, Greece and Thailand in 6 (1.06%) articles (Graph 2). A significant difference was found in the first author's country distribution according to years. In all years, the first author's country, Turkey, was statistically higher than all other countries ($p<0.05$).

The sample size was found to be between 1 and 95,484 (mean: 280±3,190.76, median: 35). In 24 articles (technical note or biomechanical study), the sample size was 0, so these articles were not included in the evaluation. No significant difference

was found in the sample size distribution according to years (p>0.05, p=0.707).



Graph 1: Percentage distribution of published articles according to orthopedics sub-branch



Graph 2: Distribution of first author by country

The results of the study were positive in 618 (59.71%) articles, negative in 73 (7.06%) articles, and neutral in 344 (33.27%) articles.

Statistical methods were used in 826 (79.81%) articles, while they were not used in 209 (20.19%) articles. There was no statistically significant difference in using statistical analysis according to years (p=0.418, Chi-Square value: 10.26).

It was reported that 953 (92.08%) published articles received no financial support, and 82 (7.92%) articles received financial support. This shows that the financial support status should have been reported or indicated. In addition, no conflict of interest was reported in any published articles.

When the published articles were evaluated according to the branch of the first author, the branch of the first author was orthopedics in 855 (82.65%) articles, physical therapy and rehabilitation in 67 (6.47%) articles, neurosurgery in 20 (1.93%) articles, anesthesia and neurosurgery in 18 (1. 74%) in anesthesia and reanimation, 14 (1.35%) in plastic, reconstructive and aesthetic surgery, 7 (0.68%) in anatomy, 5 (0.48%) in pathology, 4 (0.39%) in sports medicine, 3 (0.29%) in medical oncology. Emergency medicine, infectious diseases and clinical microbiology, pharmacology, public health, biomedical engineering, and electrical and electronics engineering were the first author's branches in 2 (0.19%) articles each. In the remaining articles, the branch of the first author belonged to other departments.

In 25 (2.42%) published articles, at least one Turkish author was accompanied by foreign authors from other countries.

The mean time between admission and acceptance was 8.26±4.91 (range: 1-34; median: 7) months. In 3 articles, the time of application and admission could not be accessed and were not included in the evaluation. The time between application and acceptance (months) and article type (correlation coefficient: 0.038, p=0.223), number of authors (correlation coefficient: -0.024, p=0.449), country of the first author (correlation coefficient: 0.038, p=0.221), institutional structure of the first author (correlation coefficient: 0.032, p=0.309), orthopedic subspecialty (correlation coefficient: 0.019, p=0.540) and sample size (correlation coefficient: -0.020, p=0.551).

The published articles were also evaluated according to the number of citations, readings, and downloads. The total number of citations to all articles was 15127. The number of citations ranged from 1 to 186 (mean: 12.78±15.68, median: 8). The number of articles with no citations was 69. The average citation number of the 100 most cited articles was 50.1. Although the number of citations fluctuated according to year, it was observed that the number of citations decreased after 2021. In the statistical analysis, it was seen that there was a positive correlation between the number of citations and the number of articles by year (correlation value: 0.79). In other words, as the number of articles increased, the total number of citations also increased. The analysis found

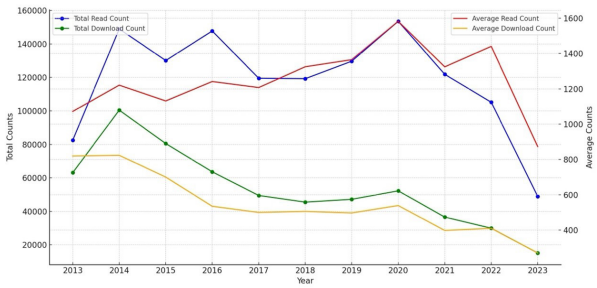
statistically significant differences between the number of citations according to years (F statistic 7.83 and $p<0.05$, $p= 3.39.x10^{-12}$). Approaching 2023, it was observed that there was a decrease in the number of citations.

All articles published have been read 1,374,721 times and downloaded 564,405 times. Detailed information about citation, download, and reading counts is summarized in Table 3. The analysis found statistically significant differences in reading and downloading counts over the years ($p<0.05$, p=1.64x10^-12). To determine between which years the differences in reading counts occurred, the Tukey HSD posthoc test results showed that the reading counted in 2020 and 2022 was significantly higher compared to 2013, and the reading counted in 2020 was considerably higher compared to 2015 to 2017. Additionally, it was found that the reading counts in 2023 were substantially lower compared to 2016 to 2018-2022. The highest total reading count by year was in 2020 (n=153,509, 11.16%) and by month in July 2021 (n=15,737, 1.14%). The main reason the total number of readings by year was the highest in 2020 is that academics spent more time on articles due to the curfew due to the COVID-19 pandemic. The highest total download count by year was in 2014 (n=100,427, 17.80%) and by month in January 2016 (n=3,951, 0.7%).

When examining the differences between reading and downloading counts over the years, the most significant difference was found in July 2021 (n=23,206), indicating that reading activities were significantly more frequent than downloading activities that year. On the other hand, the slightest difference was observed in January 2013 (n=1,994), showing that the difference between reading and downloading counts was relatively less at that time.

The multiple linear regression model analysis showed that articles with higher reading and downloading counts received more citations ($p=0.007$, $p=0.005$). This means that although citation counts have decreased over time, citations are increasing as reading and downloading counts increase. Graph 3 shows reading and downloading counts over the years.

The article with the highest number of citations was the study by Simsek et al., published in March 2013 with 186 citations [6]. The highest number of reads was the article by Lee et al., published in July 2021, with 15747 reads. However, the number of citations of this article was surprisingly 3 [7]. The highest number of downloads was the article by Huang et al., published in January 2016, with 3963 downloads. The number of citations of this article was 106 [8]. The longest distance between application and acceptance was the meta-analysis study conducted by Shengyuan et al. in August 2023, which lasted 34 months [9]. The largest sample size was the study by Hsun Lee et al., published in July 2016, with 95,484 patients. The number of citations for this study was 50 [10]. These data are based on the date the article was written.



Graph 3: Total and average number of readings/downloads by year

Discussion

The number of articles published in orthopedics and traumatology worldwide is continually increasing. This number changes as research activities globally increase. The number of studies conducted in orthopedics and traumatology is expressed in thousands each year. These studies cover various topics such as diagnosis and treatment of diseases, surgical techniques, rehabilitation methods, implants, and technological innovations. Therefore, it is difficult to state the exact number of articles published each year in this field, but it is possible to say it involves a large volume. According to a study by Lee et al., 46,322 orthopedic articles were published worldwide between 2000 and 2009 [11]. Jiang et al. reported in another study that between 2003 and 2014, 123,317 articles were published in 63 orthopedic journals in China, Hong Kong, and Taiwan [12].

In Turkey, the number of articles on the

Table 3: Number of citations, readings, and downloads of articles by year

Year	Average Number of Citations	Total Number of Citations (%)	Average Number of Reads	Total Number of Reads (%)	Average Number of Downloads	Total Number of Downloads (%)
2013	19.57	1507 (%10.65)	1071.58	82512 (%6.01)	819.17	63076 (%11.17)
2014	17.30	2110 (%14.93)	1220.65	148919 (%10.83)	823.17	100427 (%17.8)
2015	13.04	1500 (%10.6)	1131.10	130077 (%9.46)	699.83	80481 (%14.26)
2016	23.61	2810 (%19.89)	1241.18	147701 (%10.75)	534.41	63595 (%11.27)
2017	18.81	1862 (%13.18)	1207.01	119494 (%8.69)	499.63	49463 (%8.76)
2018	16.56	1490 (%10.53)	1324.78	119230 (%8.67)	505.49	45494 (%8.06)
2019	14.39	1367 (%9.68)	1369.96	129671 (%9.43)	496.53	47170 (%8.36)
2020	10.53	1021 (%7.22)	1882.57	153509 (%11.16)	538.62	52246 (%9.26)
2021	3.87	356 (%2.52)	1324.30	121836 (%8.86)	397.26	36548 (%6.48)
2022	2.33	170 (%1.2)	1440.36	105146 (%7.65)	409.53	29896 (%5.3)
2023	0.61	34 (%0.24)	872.43	48856 (%3.55)	269.88	15113 (%2.68)
Average /Total	12.78	15127	1252	1374721	544.86	564405

bibliometric analysis of orthopedic publications needs to be improved [1,13-14]. Gürbüz et al. have reported in a study examining the first 40 journals in the Science Citation Index Expanded (SCI-E) list between 1980 and 2013 that the total number of publications worldwide was 130,494, and the number from Turkey was 1,594, ranking Turkey 14th with 1.22% of total publications [13]. A study reviewing all articles of the Joint Diseases and Related Surgery (JDRS) journal, the official publication of the Turkish Joint Diseases Foundation, over 30 years (1989/1 - 2019/1) examined a total of 18 volumes comprising 44 issues and 688 articles and evaluated the pre-SCI-E period data (1989-2006). This study found that 22% of the articles were in general orthopedics, 14.4% in orthopedic trauma, and 9.7% in pediatric orthopedics. The type of articles was reported as 72.2% research articles, 16% reviews, and 10.8% case reports. The average number of authors per article was 3.8, and the average number of citations per article was 0.7. It was also reported that most articles were submitted from universities [14].

In a study in which all articles of Acta Orthopaedica et Traumatologica Turcica (AOTT), the official publication of the Turkish Association of Orthopaedics and Traumatology (TOTBID), were reviewed for a period of 10 years (2003-2012), a total of 699 articles were analyzed. As a result of this study, 18.3% of the articles were published in orthopedic trauma, 14.3% in hand and microsurgery, and 13% in general orthopedics. The most common study design was a retrospective observational study with 48.5% and a case report with 21.9%. The institution where the first author worked was reported as a university hospital in 56.4% of the articles and as a training and research hospital in 30.8%. The number of authors was reported to be between 1 and 22 (mean: 4.63±1.62, median: 5) [5]. Our study published the most shared articles in general orthopedics, orthopedic trauma, spine, and adult reconstruction/arthroplasty. Retrospective studies, basic science studies, and case reports are among the most common studies. The institution where the first author worked was a university hospital at a similar rate. In light of these data, it is concluded that more than half of the articles published in AOTT were conducted in universities.

The number of citations a paper receives generally indicates how much interest it has generated within the academic community and how much it has been used. However, high citation numbers only sometimes signify high quality. Citations may not always be made in a positive context. Some citations could point out criticisms or errors in previous studies. Moreover, citation rates can vary significantly between different scientific fields. For example, in some fields, studies quickly become outdated; in others, old studies can remain valid for a long time. Sometimes, researchers may consciously or unconsciously tend to cite each other's work. This situation can exaggerate the actual impact or quality of the work. Review articles generally receive more citations because they summarize a wide range of literature and provide comprehensive information. This does not mean that the quality of original research articles

is lower. Therefore, a paper's citation count can indicate its impact, but more is needed to judge its quality definitively. To assess the quality of an article, it is necessary to examine the content in detail, critique the methodology, and compare the findings with similar studies.

A certain amount of time is needed for a paper to be cited. This period averages between 7-10 years from the time of publication [15]. Banerjee et al. conducted a study on the bibliometric analysis of the top 100 systematic reviews and meta-analyses in the orthopedic literature, reporting that the citation count ranged from 1073 to 198, totaling 30,589 citations [16]. Kelly et al. analyzed 100 classic papers in orthopedic surgery and reported an average citation count of 446.5 [17]. Another study related to pediatric orthopedics evaluated 100 classic articles, finding the average citation count to be 168 [18]. Erivan et al. used the Scopus database to determine the citation rates for 2158 articles published in Orthopaedics & Traumatology: Surgery & Research (OTSR) and assessed the 100 most cited articles, finding an average citation count per article of 49.59±24.16 (range: 30-169) [19]. Another analysis assessed 107 articles published in the European Journal of Orthopaedic Surgery and Traumatology (EJOST), reporting an average citation count per article of 15.3 [20]. In our study, the average citation count per article was 12.78, and the average number of authors per article was 4.75. The average citation count for the top 100 most cited articles was 50.1. These results indicate that the citation count and average citation count for the first 100 articles published in AOTT are comparable to those in OTSR and EJOST.

From 2013 to 2023, a bibliometric analysis of the articles published in AOTT shows a notable trend regarding the gender distribution of the first authors. Notably, the proportion of female first authors has been relatively low over these eleven years. This situation indicates that gender equality has not yet been fully achieved in fields such as orthopedics and traumatology. The underrepresentation of female researchers in academic publications points to structural issues that could hinder the career development of women in these fields. Although various studies on gender differences in surgical fields have been conducted recently, no consistency has been found [21-23]. One study reported that the orthopedics department lags behind general surgery and other surgical branches regarding female representation [23]. Hiller et al. conducted a survey covering the bimonthly issues of Clinical Orthopaedics and Related Research® (CORR®), Journal of Bone and Joint Surgery, American Volume (JBJS), and American Journal of Sports Medicine (AJSM) from 2006 to 2017, examining the original research publications. It was found that a woman wrote 13% of the 6292 articles (800) as the first author. During the examined period, the percentage of female first authors at JBJS was 14%, while at CORR and AJSM, it was 12%. The overall rate of female first authors in the journals studied increased (from 11% in 2006 to 17% in 2017) [24]. In our study, the percentage of female first authors varied over the years but averaged around 10%. The low rate of female first authors can be explained in several ways. One reason is the relatively lower number of female orthopedists globally and in our country than males. Another reason is the imbalance between family and work, which is skewed against women in the field of orthopedic surgery.

In recent years, the increasing number of authors in academic publications has emerged as a notable trend. Although this increase reflects positive developments such as expanded research scope and increased interdisciplinary collaboration, it also brings undeserved or inappropriate authorship problems [24]. Factors like career advancement and funding pressures in academic circles can compel some researchers to add their names to papers without significant contributions, a practice considered unethical in scientific research and endangering the integrity of the study. Thus, academic journals and related institutions must clearly define authorship criteria and strictly adhere to them. This would ensure that researchers who genuinely contribute to the scientific literature receive deserved recognition and that the quality of research is maintained. Rahman et al. conducted a study on the number of authors and their geographical origins in articles published in the Journal of Bone and Joint Surgery British Volume (JBJS) and Clinical Orthopaedics and Related Research (CORR) over the last 50 years, analyzing 2776 articles published in ten-

year intervals between 1958 and 2008 (CORR, n=1809; JBJS, n=967). They found a significant increase in the average number of authors per article from 1.638 to 4.08 in CORR (P<.0001) and from 1.633 to 4.540 in JBJS (P<.0001). They also emphasized the need for efforts by the International Committee of Medical Journal Editors or individual journals to prevent the proliferation of inappropriate authorship [25]. Camp et al. examined all original research articles and case reports published in The Journal of Bone and Joint Surgery (American and British Volumes) (JBJS-A and JBJS-B) over ten-year intervals from 1949 to 2009. They reported that the average number of authors in original research articles increased from 1.6 in 1949 to 5.1 in 2009, suggesting a trend of growing authorship in biomedical research is also evident in orthopedic literature [24]. Yalçınkaya et al. conducted a study on 699 articles published in AOTT between 2002 and 2013, analyzing the number of authors and the institutions they are affiliated with. They found that the number of authors ranged from 1 to 22 (average: 4.63±1.62, median: 5), and the number of institutions ranged from 1 to 21 (average: 1.72±1.23, median: 1). They also noted that the 'publish or perish' phrase still holds [5]. In our study, the total number of authors ranged from 1 to 15 (average: 4.75±1.53, median: 5), and the number of institutions they are affiliated with averaged 2.24±1.32 (range:1-14, median:2). These two studies show that while the average number of authors is similar, the number of institutions they are affiliated with has increased.

This article has some limiting factors. Analyzing articles within a specific time frame can lead to missing a broader perspective. Moreover, the citation counts of the articles, especially for newly published ones, may be low, which may not reflect the true impact of the studies.

Conclusions

This study includes a bibliometric analysis of the articles published in AOTT in the last 11 years. Although the citation numbers of recently published articles are low, it is evident that these numbers will increase over time. In addition, an increase in the number of female first authors in the future will be an essential parameter for gender equality.

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REFERENCES

1. Hood, W.W., Wilson, C.S. The Literature of Bibliometrics, Scientometrics, and Informetrics. Scientometrics. 2001;52(2):291–314. doi: 10.1023/A:1017919924342.
2. Broadus R. Toward a definition of "bibliometrics." Scientometrics. 1987;12(5):373-379. doi: 10.1007/BF02016680.
3. Demirhan M. From The Editor. Acta Orthop Traumatol Turc. 2016;50(1):1
4. Acta Orthopaedica et Traumatologica Turcica. (n.d.). Aims, scope, and audience. Retrieved March 2024, from https://www.aott.org.tr/en/about-105
5. Yalçınkaya M, Bagatur AE. Articles published in Acta Orthopaedica et Traumatologica Turcica between 2003-2012: content, characteristics and publication trends. Acta Orthop Traumatol Turc. 2014;48(5):576-83. doi: 10.3944/AOTT.2014.14.0079.
6. Şimşek HH, Balki S, Keklik SS, Öztürk H, Elden H. Does Kinesio taping in addition to exercise therapy improve the outcomes in subacromial impingement syndrome? A randomized, double-blind, controlled clinical trial. Acta Orthop Traumatol Turc. 2013;47(2):104-10. doi: 10.3944/aott.2013.2782.
7. Lee WY, Shin HD, Kim KC, Cha SM, Jeon YS. Relationship between incidence of postoperative radial nerve palsy and surgical experience in treating humeral shaft fractures through a posterior triceps splitting approach: A retrospective study. Acta Orthop Traumatol Turc. 2021;55(4):338-43. doi: 10.5152/j.aott.2021.20415.
8. Huang W, Zhang Y, Yao Z, Ma L. Clinical examination of anterior cruciate ligament rupture: a systematic review and meta-analysis. Acta Orthop Traumatol Turc. 2016;50(1):22-31. doi: 10.3944/AOTT.2016.14.0283.
9. Shengyuan T, Zihang X, Changbing W, Junhua W, Hong W. The influence of obesity on the complications and outcomes of shoulder arthroplasty: A systematic review and meta-analysis. Acta Orthop Traumatol Turc. 2023;57(4):154-60. doi: 10.5152/j.aott.2023.20300.
10. Lee SH, Chen IJ, Li YH, Fan Chiang CY, Chang CH, Hsieh PH. Incidence of second hip fractures and associated mortality in Taiwan: A nationwide population-based study of 95,484 patients during 2006-2010. Acta Orthop Traumatol Turc. 2016;50(4):437-42. doi: 10.1016/j.aott.2016.06.008.
11. Lee KM, Ryu MS, Chung CY, Choi IH, Kwon DG, Kim TW, et al. Characteristics and trends of orthopedic publications between 2000 and 2009. Clin Orthop Surg. 2011;3(3):225-9. doi: 10.4055/cios.2011.3.3.225.
12. Jiang H, Nong B, Yang L, Zong S, Zhan X, Wei Q, et al. Assessing the evolution of scientific publications in orthopedics journals from mainland China, Hong Kong, and Taiwan: a 12-year literature survey. J Orthop Surg Res. 2016;11(1):69. doi: 10.1186/s13018-016-0404-z.
13. Gürbüz Y, Süğün TS, Özaksar K. A bibliometric analysis of orthopedic publications originating from Turkey. Acta Orthop Traumatol Turc. 2015;49(1):57-66. doi: 10.3944/AOTT.2015.14.0044.
14. Aslan A. Bibliometric analysis of the Journal of Joint Diseases and Related Surgery: Part 1: the period before the SCI-E. Acta Med. Alanya. 2019;3(3):300-5. doi: 10.30565/medalanya.617683
15. Kambhampati, Srinivas BS, Raju Vaishya. Most cited publications in arthroscopy. Journal of Arthroscopic Surgery and Sports Medicine. 2020;1(2):212-7. doi: 10.25259/JASSM_5_2020.
16. Banerjee S, Khatri N, Kaur A, Elhence A. Bibliometric Analysis of Top 100 Systematic Reviews and Meta-analyses in Orthopaedic Literature. Indian J Orthop. 2022;56(5):762-70. doi: 10.1007/s43465-022-00604-9.
17. Kelly JC, Glynn RW, O'Briain DE, Felle P, McCabe JP. The 100 classic papers of orthopedic surgery: a bibliometric analysis. J Bone Joint Surg Br. 2010;92(10):1338-43. doi: 10.1302/0301-620X.92B10.24867.
18. Kavanagh RG, Kelly JC, Kelly PM, Moore DP. The 100 classic papers of pediatric orthopedic surgery: a bibliometric analysis. J Bone Joint Surg Am. 2013;95(18):e134. doi: 10.2106/JBJS.L.01681.
19. Erivan R, Villatte G, Ollivier M, Reina N, Descamps S, Boisgard S. The top 100

most-cited Orthopaedics & Traumatology: Surgery & Research articles. Orthop Traumatol Surg Res. 2019;105(8):1459-62. doi: 10.1016/j.otsr.2019.01.016.

20. Mavrogenis AF, Megaloikonomos PD, Mauffrey C, Scarlat MM, Simon P, Hasegawa K, et al. The best cited articles of the European Journal of Orthopaedic Surgery and Traumatology (EJOST): a bibliometric analysis. Eur J Orthop Surg Traumatol. 2018;28(4):533-44. doi: 10.1007/s00590-018-2147-5.
21. Day CS, Lage DE, Ahn CS. Diversity based on race, ethnicity, and sex between academic orthopedic surgery and other specialties: a comparative study. J Bone Joint Surg Am. 2010;92(13):2328-35. doi: 10.2106/JBJS.I.01482.
22. Reed DA, Enders F, Lindor R, McClees M, Lindor KD. Gender differences in academic productivity and leadership appointments of physicians throughout academic careers. Acad Med. 2011;86(1):43-7. doi: 10.1097/ACM.0b013e3181ff9ff2.
23. Hiller KP, Boulos A, Tran MM, Cruz AI Jr. What Are the Rates and Trends of Women Authors in Three High-impact Orthopaedic Journals from 2006-2017? Clin Orthop Relat Res. 2020;478(7):1553-60. doi: 10.1097/CORR.0000000000001043.
24. Camp M, Escott BG. Authorship proliferation in the orthopedic literature. J Bone Joint Surg Am 2013;95(7):e44. doi: 10.2106/JBJS.L.00519.
25. Rahman L, Muirhead-Allwood SK. How many orthopedic surgeons does it take to write a research article? Fifty years of authorship proliferation in and internationalization of the orthopedic surgery literature. Orthopedics. 2010;33(7):478. doi: 10.3928/01477447-20100526-06.